



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,466	03/30/2004	Sanjeev M. Naik	GP-303149	3142
7590 12/13/2005 KATHRYN A MARRA General Motors Corporation Legal Staff, Mail Code 482-C23-B21 P.O. Box 300 Detroit, MI 48265-3000			EXAMINER NGUYEN, TU MINH	
			ART UNIT 3748	PAPER NUMBER
DATE MAILED: 12/13/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/812,466

Applicant(s)

NAIK, SANJEEV M.

Examiner

Tu M. Nguyen

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                         |                                                                             |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____                                                             | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. An Applicant's Amendment filed on November 15, 2005 has been entered. Claims 1, 2, 6, 7, and 9-11 have been amended. Overall, claims 1-13 are pending in this application.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Sun et al. (U.S. Patent 6,253,546).

Re claims 1, 6, and 10, as shown in Figures 1-4, Sun et al. disclose a method, a system, and an article of manufacture (15) comprising a storage medium (84) having a computer program encoded therein for controlling a direct-injection gasoline engine (10) during regeneration of a lean NOx trap (53) disposed in an exhaust path of the engine, the regeneration characterized by a transition from stratified lean engine operation to homogeneous rich engine operation, comprising:

- determining a base desired torque (brake torque) (lines 7-24 of column 4);
- estimating a decrease in engine torque that would result from transitioning from stratified lean engine operation to homogeneous rich engine operation during a lean NOx trap

Art Unit: 3748

regeneration (during the regeneration, a reduction of intake manifold pressure is computed in expression (2); this reduction causes a decrease in engine torque (also see lines 25-43 of column 4)); and

- applying a feed-forward compensating control torque (fueling rate or spark timing adjustment) to the engine in an amount sufficient to compensate for the estimated decrease in engine torque thereby maintaining the base desired torque level during the lean NO<sub>x</sub> trap regeneration (see line 43 of column 4 to line 19 of column 5).

Re claims 2, 7, and 11, in the method, system, and article of manufacture of Sun et al., estimating a decrease in engine torque comprises (see lines 28-43 of column 4):

- determining a desired mass of air charge (lines 33-34 of column 4) and exhaust gas recirculation (lines 36-38 of column 4) for a lean NO<sub>x</sub> trap regeneration;
- determining a reference value ( $P_m$ ) for manifold absolute pressure for the lean NO<sub>x</sub> trap regeneration; and
- determining a feed-forward compensating control torque value (see expression (3)) sufficient to maintain the base desired torque level during lean NO<sub>x</sub> trap regeneration from the determined desired mass of air charge and exhaust gas recirculation and the determined reference value for manifold absolute pressure.

Re claims 3, 8, and 12, in the method, system, and article of manufacture of Sun et al., applying a compensating control torque to the engine comprises increasing fueling to the engine in an amount sufficient to effect said compensating control torque (see Figure 4D, lines 27-30 of column 5, and lines 12-19 of column 5).

Re claim 4, in the method of Sun et al., determining a base desired torque is accomplished in accordance with one or more of a throttle pedal position, a cruise control setting and an idle speed control (lines 9-24 of column 4).

Re claims 5, 9, and 13, the method and article of manufacture of Sun et al. further comprising (see Figure 2 and lines 37-42 and 48-50 of column 3):

- determining the end of the lean NOx trap regeneration event; and
- ending the step of applying a compensating control torque at the end of the lean NOx trap regeneration.

#### ***Response to Arguments***

4. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

In response to applicant's argument that Sun et al. fail to disclose or suggest a feed-forward compensating control torque value (page 10 of Applicant's Amendment), the examiner respectfully disagrees.

As indicated in the Abstract, Sun et al. state that "*The method includes the steps of generating feedforward values of first engine characteristics as a function of desired engine torque and generating feedback values of second engine characteristics as a function of intake manifold pressure. Target values are then calculated for predetermined engine variables based on the first and second engine characteristics. Engine variables are then set to the target values to compensate for torque disturbances resulting from the lean NOx trap purge cycle.*" This

Art Unit: 3748

method is similar to that in the pending application in which during a regeneration mode of a NOx trap, desired mass of air charge and EGR are computed and fed-forward to a controller in step 210. Based on these feedforward values, a compensating torque value is computed in step 214 and engine variables such as spark and fuel injection timing are adjusted based on this compensating torque value (step 218). Since the reference of Sun et al. describes a similar method to control torque as that of the pending application, it is clear to all that Sun et al. disclose a feed-forward compensating control torque value.

### *Conclusion*

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 3748

*Communication*

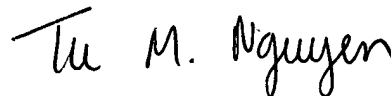
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

December 8, 2005



Tu M. Nguyen

Primary Examiner

Art Unit 3748